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*27 May 1968*

*Memorandum For Record.*

*Subject: Resume of Contract // [redacted] Specific Format Contact* 25X1  
*Chip Printer, [redacted]*

25X1A

BACKGROUND:

Existing camera systems and film combinations dictate that the photo interpreter be furnished the ultimate in high quality material in order to gain the most information from his interpretation process. The current method of physically cutting target areas out of second generation rolls of duplicate film is the only practical way of obtaining this quality. This method, although workable, is expensive and obviates the use of these rolls of duplicate film for any other purpose.

The mensuration aspect, as now performed, also requires the highest quality materials, which is a second generation duplicate positive, or in some cases a third generation duplicate negative. Some mensuration equipment in NPIC is designed to handle roll film, but for the most part, cut film is used for measurements, the main reason being ease of handling cut film over roll film with its associated transport systems.

The objectives behind an R&D effort for a cut film printer, or a Contact Chip Printer, as this effort was designated are numerous, some of which are as follows:

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25X1A a. A method of producing high quality photographic film chips of desired target areas in quantities required to meet operational needs. [REDACTED]

[REDACTED] Somewhere in this process degradation occurs and studies performed show that the degradation or loss of information content cannot be pinpointed as to where it occurs. Thusly, a contact printer can print an infinite number of copies, all of the same quality, if printed from the same input material at the same time.

b. A properly formatted film chip for use with the mensuration equipment currently in use.

c. A system which will reduce the amount of film handling now required of the operational groups.

d. A convenient and usable formatted film chip which will permit transition to an automated or semi-automated storage and retrieval system if and when required. This objective is further emphasized by the pending establishment of a National Data Base within NPIC, since a hard-copy data base is felt to be a necessity.

25X1A e. A more recent objective has come to the fore with the advent of a new acquisition system which, if duplicated [REDACTED] as current procedures dictate, could very quickly deplete the national stock of silver required for the film manufacture.

The current emphasis in both photo interpretation and photo mensuration is that of using cut film for analysis. This is being carried out by a manual system of screening and selection from roll film, cutting and mounting stereograms for interpretation or cutting out single frames or pieces of frames for

<sup>stereoscopic</sup>  
~~monoscopic~~ or stereoscopic mensuration. A development effort for a high performance printer capable of producing duplicate exposures of a specific format containing the highest possible quality, resolution and acutance was felt a necessity to overcome this vast amount of film reproduction, film handling, stereo preparation and associated chores.

As a consequence, NPIC Development Staff prepared detailed performance requirements which were sent out to nine companies for bid. Four companies responded with bids ranging [redacted] A thorough evaluation resulted in a contract award [redacted] [redacted] in the amount of [redacted] in June 1964. Of this amount [redacted] was from FY-64 funds and the remaining was from FY-65 funds.

CURRENT STATUS OF PROGRAM

The contract for design and fabrication of a Specific Format Contract Chip Printer was a two-phase contract for (1) Preliminary Design, Breadboarding and Final Design Development and (2) Fabrication, Test and Delivery of the final product, with fabrication not beginning until written approval of all design goals was received. Phase I was completed on 31 January 1965. After numerous and lengthy discussions a CPIF proposal for Phase II was submitted by the contractor on 13 August 1965. Authorization to proceed was then furnished (Amendment #2 dated 13 December 1965) with an accompanying Change in Scope in the amount [redacted] which resulted from extended breadboarding in Phase I and re-evaluation of Phase II efforts, bringing the total contract [redacted] including fee. At the same time the Procurement Division negotiated a Contract Ceiling Price [redacted] the purpose of which was to limit any possible overrun to that amount. In essence, if the contractor, through an overrun, reached the negotiated ceiling price, the contract became essentially a fixed

price contract, the contractor received nothing beyond the ceiling price and must complete the contract at his own expense. This is exactly what has transpired. The contractor notified the contracting officer on 13 February 1967 that he had expended the entire contract amount (reference Memorandum for DDI, dated 16 February 1967, NPIC/D-24-67, Subject; Request for Overrun of

25X1A [ ] After looking at all alternatives, it was decided to fund the  
25X1A overrun to the ceiling price [ ] (Amendment #3 dated 14 March 1967).  
This amendment also extended the delivery date to 30 June 1967.

Progress during Phase II was very satisfactory to this point in spite of a change in program managers (February 1967) and numerous technical personnel. However, from June 1967--the delivery date--to the <sup>actual delivery date</sup> ~~present~~, numerous malfunctions ~~have~~ occurred to prevent performance of the Acceptance Test Procedures (ATP). Nearly two months were spent in trying to make the chip drop mechanism function as designed; the lamphouse completely burned out due to faulty circuitry; the character generator, once operating, did not function reliably; and for six weeks the instrument was plagued with an intermittent RFI noise that the contractor was unable to locate. This caused an erratic response in the X axis drive and the [ ] Quality Control personnel would not give their OK to proceed with the ATP.

25X1A On 6,7,8 December 1967, the technical monitor together with members of  
25X1A TD/EPS went [ ] to perform the ATP on the basis that the instrument was working. During these three days the printer developed numerous malfunctions such as two switches failed to operate, which was corrected; the position accuracy and mensuration portions of the ATP failed to meet the specification; the lamp house shorted out three times; and the liquid gate system failed in that the wet film chips would not load into the holders. Additionally, the design

did not account for drying the input film prior to respooling on the take-up reel; there existed a toxic fumes problem resulting from lack of a cut-off on the pressurized liquid tank; and the character generator which applied the alphanumerics and machine readable code did not meet density expectations.

25X1A After considerable discussion, [ ] said they would continue work on the instrument and correct the deficiencies to our satisfaction and establish a date for another ATP. A new program manager was then assigned (the third one) which served to extend the ATP date still farther, since he had to get up to date with the program and investigate the problem areas. The contractor 25X1A wanted to complete the program ASAP because he had an estimated [ ] of company money invested over the contract ceiling and was maintaining a staff of 8-10 technicians and engineers, full time on the project.

On 24 January 1968 the contractor sent the Project Engineer and the Program Manager down to discuss the following problem areas that were solved since the last ATP attempt on 6,7,8 December.

(1) Lamphouse Arcing - solved throughout by installation of heavier insulated cables, heavier connectors, widening all air gaps in <sup>the</sup> system and relieving <sup>the</sup> possibility of Corona effect by rounding all corners & edges.

(2) Counter - X direction - reworked electronics to make input pulse compatible with counter input capability.

(3) Toxic fumes from supply tank - Installed a time delay on by-pass valve reducing toxic-fume escape time to less than one minute per run.

(4) Character Generator - Extreme density variation between characters..

25X1A This was partially solved by use of a new material [ ]  
25X1A [ ]

(5) Chip Drop Mechanism - redesigned to drop one side at a time with dog or catch to insure only <sup>one</sup> chip gets loaded at a time.

On 4-5 March another preliminary ATP was held with the project monitor and a member of TPD in attendance. The results were considerably better than the December ATP. However, the chip loading mechanism failed to operate correctly on three different tests; multiple drops occurred; X position was lost during printing; gate liquid seeped on under side of film; and the machine readable code was not yet up to expectations. This was all discussed with the contractor prior to leaving the plant. They (program manager) seemed to feel there was nothing that could not be overcome by the time of the official ATP which was set up for 19-20-21 March 1968.

On those dates the printer functioned very well, and all operations of the ATP were performed. Accordingly, the instrument was accepted and sent ~~via~~ to

[redacted] for test and evaluation.

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*Conclusion: Printer was [redacted] for T&E from 29 March 68 to 12 June 68. Erratic operation continually - see [redacted] T&E report. During this time it was decided the Center had no firm requirement for a Chip system and search was started for a user. After an unsuccessful search, it was decided to give the printer [redacted] for use on contract [redacted] (Automatic Target Recognition). They wanted to use the transport system and will eventually cannibalize the equipment when they are finished.*

*P.H.*